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CLAIMS

What is claimed is:

- 5 1. A data structure including a plurality of primitives, each primitive for at least temporary storage in a computer-readable medium at a client and in a computer readable medium at a server during transfer of said primitives over a network between the client and the server, characterized in that
- the data structure includes a get presence primitive (32) provided from
10 a client of a requesting user to a server to request presence information of a requested user, that the get presence primitive has various information elements including a requesting user identifier, a requested user identifier, and a list of presence values requested, that
- the data structure includes a presence primitive (33) provided from the
15 server to the requesting user client to provide the presence information, and that the presence primitive has various information elements including the requested user identifier and a list of presence values supplied.
2. The data structure of claim 1, characterized in that
- 20 the data structure includes a request presence authorization primitive (36) provided from the server to a requested user client to request authorization to provide presence information of the requested user to the requesting user, that the request presence authorization primitive includes various information elements including the requesting user identifier, that
- 25 the data structure includes an authorize presence primitive (37) provided from the requested user client to the server to authorize transfer of the presence information of the requested user to the requesting user, and that the authorize presence primitive includes various information elements including the requesting user identifier.

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3. The data structure of claim 1, characterized in that the data structure includes an update presence primitive (31) provided from a client of an updating user to the server to provide updated presence information of the updating user, and that the update presence primitive
5 includes various information elements including an updating user identifier and a list of presence values to be updated.
4. The data structure of claim 1, characterized in that the data structure includes a subscribe presence primitive (80) provided
10 from a client of a subscribing user to the server to request a subscription to presence information, and that the subscribe presence primitive includes various information elements including a subscribing user identifier.
- 15 5. The data structure of claim 1, characterized in that the data structure includes an authorize presence primitive (37, 84) autonomously provided from an initiating client to the server to authorize transfer of presence information of a user of the initiating client to an authorized user, and that the autonomously provided authorize presence
20 primitive includes various information elements including an identifier for identifying the user of the initiating client.
6. The data structure of claim 1, characterized in that said presence information is classifiable in any one or more of the
25 following: client reachability, user availability, user personal status, user or client location, and client capabilities.

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7. The data structure of claim 1, characterized in that
the data structure includes a message primitive (140, 142) provided
from a message sending client to the server and from the server to a message
receiving client, and that
- 5 the message primitive has various information elements including a
sending client identifier, a sending user identifier, and a message content type
identifier.
8. The data structure of claim 7, characterized in that
- 10 the data structure includes a delivery primitive (144, 146) provided
from the server to the message sending client, and that
the delivery primitive has various information elements including
status of message delivery.
- 15 9. The structure of claim 7, characterized in that
the data structure includes a join group primitive (190) provided from a
joining client to the server, and that
the join group primitive includes information elements including a
group identifier.
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10. The data structure of claim 7, characterized in that
the data structure includes a leave group primitive (192) provided from
a leaving client to the server, and that
the leave group primitive includes various information elements
- 25 including an identification of a session.
11. The data structure of claim 7, characterized in that
the data structure includes a group left primitive (194) provided from
the server to a client, and that

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the group left primitive includes various information elements including an identifier of a reason for a leaving.

12. The data structure of claim 7, characterized in that

5 the data structure includes a create group primitive (400) provided from a group creating client to the server, and that

the create group primitive includes various information elements including a message identifier, a transaction identifier and an identifier of properties of the group.

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13. The data structure of claim 9, characterized in that the join group primitive includes information elements including a message identifier, a transaction identifier and said group identifier.

15 14. The data structure of claim 7, characterized in that

the data structure includes a delete group primitive (412) provided from a deleting client to the server, and that

the delete group primitive includes various information elements including a message identifier, a transaction identifier and a group identifier.

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15. The data structure of claim 7, characterized in that

the data structure includes a modify group primitive (408) provided from a modifying client to the server, and that

25 the modify group primitive includes various information elements including a message identifier, a transaction identifier and a group identification.

16. The data structure of claim 7, characterized in that

30 the data structure includes a get group info primitive (404) provided from a client requesting group information to the server, and that

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the get group info primitive includes various information elements including a message identifier, a transaction identifier and a group identifier.

17. The data structure of claim 1, characterized by said presence values
5 associated with corresponding presence attributes classified and typed according to a standard.

18. A device having means for at least temporarily storing a data structure for transmission or reception, characterized in that said data structure is
10 according to claim 1.

19. A system having at least one server able to communicate with a plurality of devices, wherein a communication protocol is used between the at least one server and the plurality of devices with a data structure according to
15 claim 1.

20. The system of claim 19, characterized by said presence values having associated space and time information useable by said at least one server to modify said presence values or related presence values.
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21. The system of claim 20, characterized by said presence values having a validity attribute associated to said space and time information.

22. Presence information service management method for use by a server,
25 characterized by

a step of said server receiving (37, 38, 64; 84) presence authorization messages from users wherein said presence authorization messages are initiated by said users to pre-authorize access to selected presence information of said users, by

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a step of said server receiving (31, 35; 86) presence information update messages from updating users wherein said update messages are initiated by said updating users, by

5 a step of said server receiving (32; 80) presence information request messages from presence service requesting users including users requesting presence information to which a response is required and including subscribing users initially subscribing to presence information to which on-going responses including requested presence information are required, by

10 a step of said server determining (133f) if access to said requested presence information has been pre-authorized and, if not, requesting authorization (36, 54; 82) from a requested user whose presence information has been requested, and if authorized or pre-authorized, by

15 a step of said server providing (33) said requested presence information to which a response is expected to said requesting users requesting presence information to which a response is expected and providing (88, 90) requested presence information on an on-going basis to said subscribing users subscribing to presence information to which on-going responses are required, particularly after receiving said presence information update messages from said updating users.

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23. The presence information service management method of claim 22, characterized in that each of said presence information request messages comprises a primitive having various mandatory information elements including a message identifier, a transaction identifier, and an identification of
25 a requested user.

24. The presence information service management method of claim 23, characterized in that said primitive has at least one optional information element comprising a list of presence values requested.

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25. The presence information service management method of claim 22, characterized in that said step of requesting authorization from a requested user is carried out by means of an authorization message comprising a primitive having various mandatory information elements including a message
5 identifier, an authorization request transaction identifier, a requesting user identifier and a list of presence values.

26. The presence information service management method of claim 22, characterized in that presence information is authorized by means of said
10 authorization messages from authorizing users each comprising an authorization primitive having various mandatory information elements including a message identifier, an authorization request transaction identifier, a requesting user identifier, and a list of presence values.

15 27. The presence information service management method of claim 26, characterized in that said primitive has at least one optional information element comprising a group identifier if authorization is related to a group.

28. The presence information service management method of claim 22,
20 characterized in that a buddy list user maintains one or more buddy lists on a server for sending messages to one or more recipient users separately or to a whole buddy list, wherein the recipient users are not necessarily aware of the buddy list and cannot refer to the buddy list with any replies they make, and said buddy list user maintaining one or more buddy lists on said server is able
25 to access buddy list presence information.

29. The presence information service management method of claim 22, further characterized by
a step of said server receiving (190) join group primitives from member
30 users joining a private user group, by

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a step of said server providing (186) presence primitives indicative of presence information of member users of said private user group to each member user upon joining said private user group but not after departing, and by

5 a step of said server providing (194) group left primitives indicative of departed member users to remaining private user group member users upon receipt (192) of leave group primitives indicative of said departing member users.

10 30. The presence information service management method of claim 29, characterized in that member users are joined by said step of joining only if said join group message is preceded by a step of providing an invitation to join primitive to said joining member user.

15 31. The presence information service management method of claim 22, further characterized by

a step of said server receiving (400) a create group primitive from a member user creating a user group, said create group primitive having information elements indicative of identification of a client used by the user
20 creating the user group, identification of the member user creating the user group, and a list of member users of the user group, by

a step of said server reporting (402) to the member users with a group information primitive indicative of establishment of the user group and selected group information, and by

25 a step of said server permitting member users of the user group to interchange message primitives.

32. The method of claim 31, further characterized by

a step of said server receiving (404) a request for group information
30 from a requesting member user, and by

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a step of said server reporting (406) to the requesting member user with a group information primitive indicative of selected group information.

33. The method of claim 31, further characterized by

5 a step of said server receiving (408) a request to modify said user group from a requesting member user, and by

a step of said server reporting (410) to the requesting member user with a group information primitive indicative of selected group information.

10 34. The method of claim 31, further characterized by

a step of said server receiving (412) a request to delete said user group from a requesting member user, and by

a step of said server reporting to the member users with a status primitive indicative of disestablishment of said user group.

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35. The presence information service management method of claim 22, further characterized by

a step of said server receiving (550) a store content primitive from a storing user and storing any content conveyed in a content information

20 element of said content primitive along with or according to information elements identifying said store content primitive, a store transaction, a storing user, a storing client used by said storing user, a group, properties of said content, and a header of said content, by

25 a step of said server providing (552) a content information primitive to member users in said group having information elements identifying said content information primitive, said store transaction, and said header, by

30 a step of said server receiving (562) a get content information primitive from a retrieving user in said group having information elements identifying said get content primitive, a retrieval transaction, the retrieving user, a retrieving client used by said retrieving user, and said group, and by

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a step of said server providing (565) a receive content primitive to said retrieving user having information elements identifying said receive content primitive, said retrieval transaction, said group, said content, said header of said content, and having an information element containing shared content for
5 storing among said member users.

36. The method of claim 29, further comprising the steps of
a step of said server receiving (564) a delete content primitive from a deleting user having information elements identifying said delete content
10 primitive, a delete transaction, the deleting user, a deleting client used by said deleting user, said group, and content for deletion, and by
a step of said server deleting said shared content.

37. The presence information service management method of claim 22,
15 further characterized by
a step of said server providing (552) a content information primitive to a notified user from a server having information elements identifying said content information primitive, a store transaction, and a header, by
a step of said server receiving (562) a get content information primitive
20 from said notified user having information elements identifying said get content primitive, a retrieval transaction, and said notified user, and by
a step of said server providing (565) a receive content primitive from said server to said notified client having information elements identifying said receive content primitive, said retrieval transaction, said header, and having
25 an information element containing shared content.

38. The method of claim 34 for adding to said shared content at said server by a storing user, further characterized by a step of said server receiving (550) a store content primitive at said server having content in an information
30 element thereof for said adding to said shared content along with or according

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to information elements identifying said store content primitive, a store transaction, the storing user and a header.

39. The method of claim 37 for deleting from said shared content at said
 5 server by a deleting user, further characterized by a step of said server
 receiving (564) a delete content primitive from said deleting user at said
 server, said primitive having information elements identifying said delete
 content primitive, a delete transaction, the deleting user and content for
 deletion.

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40. The presence information service management method of claim 22,
 further characterized by an exception management method for use in exception
 handling of a transaction by a user or server in responding to a request by said
 server or said user, respectively, by
 15 a step of providing a status primitive in said responding to said request
 for indicating success or failure of said transaction as well as further
 information contained in information elements of said status primitive, and by
 a step of receiving said status primitive in said requesting server or said
 requesting user for recognizing said indication of success or failure.

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41. The method of claim 40, wherein said information elements include a
 message identifier, a transaction identifier, and a status value indicative of
 said success or failure.

25 42.A server for carrying out a presence information service management
 method for clients, characterized by
 means (625; 133p) for receiving presence authorization messages (37,
 38, 64; 84) from users wherein said presence authorization messages are
 initiated by said users to authorize access to selected presence information of
 30 said users, by

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means (425) for receiving presence information update messages (31, 35; 86) from updating users wherein said update messages are initiated by said updating users, by

means (46s; 133i) for receiving presence information request messages
5 from presence service requesting users including users requesting presence information to which a response is required and including subscribing users initially subscribing to presence information to which on-going responses including requested presence information are required, by

means (133f) for determining if access to said requested presence
10 information has been authorized and, if not, for requesting authorization (133n) from a requested user whose presence information has been requested, and by

means (50s; 133k) for providing said requested presence information to
15 which a response is expected to said requesting users requesting presence information to which a response is expected and for providing requested presence information on an on-going basis to said subscribing users subscribing to presence information to which on-going responses are required, particularly after receiving said presence information update messages from said updating users.

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43. The server of claim 42, characterized in that each of said presence information request messages comprises a primitive having various mandatory information elements including a message identifier, a transaction identifier, and an identification of a requested user.

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44. The server of claim 43, characterized in that said primitive has at least one optional information element comprising a list of presence values requested.

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45. The server of claim 42, characterized in that said means for requesting authorization from a requested user provides an authorization message comprising a primitive having various mandatory information elements including a message identifier, an authorization request transaction identifier,
5 a requesting user identifier and a list of presence values.

46. The server of claim 42, characterized in that presence information is authorized by means of said authorization messages from authorizing users each comprising an authorization primitive having various mandatory
10 information elements including a message identifier, an authorization request transaction identifier, a requesting user identifier, and a list of presence values.

47. The server of claim 46, characterized in that said primitive has at least
15 one optional information element comprising a group identifier if authorization is related to a group.

48. The server of claim 42, characterized in that a buddy list user maintains one or more buddy lists on a server for sending messages to one or
20 more recipient users separately or to a whole buddy list, wherein the recipient users are not necessarily aware of the buddy list and cannot refer to the buddy list with any replies they make, and said buddy list user maintaining one or more buddy lists on said server is able to access buddy list presence information.

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49. The server of claim 42, further characterized by
means (258) for receiving join group primitives from member users joining a private user group, by

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means (266) for providing presence primitives indicative of presence information of member users of said private user group to each member user upon joining said private user group but not after departing, and by

means (288) for providing group left primitives indicative of departed
5 member users to remaining private user group member users upon receipt of leave group primitives indicative of said departing member users.

50. The server of claim 49, characterized in that member users are joined by said step of joining only if said join group message is preceded by
10 providing an invitation to join primitive to said joining member user.

51. The server of claim 42, further characterized by

means (450) for receiving a create group primitive from a member user creating a user group, said create group primitive having information elements
15 indicative of identification of a client used by the user creating the user group, identification of the member user creating the user group, and a list of member users of the user group, by

means (456) for reporting to the member users with a group information primitive indicative of establishment of the user group and
20 selected group information, and by

means (27b) for permitting member users of the user group to interchange message primitives.

52. The server of claim 51, further characterized by

25 means (458) for receiving a request for group information from a requesting member user, and by

means (456) for reporting to the requesting member user with a group information primitive indicative of selected group information.

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53. The server of claim 51, further characterized by
means (462) for receiving a request to modify said user group from a
requesting member user, and by
means (456) for reporting to the requesting member user with a group
5 information primitive indicative of selected group information.

54. The server of claim 51, further characterized by
means (466) for receiving a request to delete said user group from a
requesting member user, and by
10 means (456) for reporting to the member users with a status primitive
indicative of disestablishment of said user group.

55. The server of claim 42, further characterized by
means (650) for receiving a store content primitive from a storing user
15 and storing any content conveyed in a content information element of said
content primitive along with or according to information elements identifying
said store content primitive, a store transaction, a storing user, a storing client
used by said storing user, a group, properties of said content, and a header of
said content, by
20 means (660) for providing a content information primitive to member
users in said group having information elements identifying said content
information primitive, said store transaction, and said header, by
means (654) for receiving a get content information primitive from a
retrieving user in said group having information elements identifying said get
25 content primitive, a retrieval transaction, the retrieving user, a retrieving
client used by said retrieving user, and said group, and by
means (668) for providing a receive content primitive to said retrieving
user having information elements identifying said receive content primitive,
said retrieval transaction, said group, said content, said header of said content,

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and having an information element containing shared content for storing among said member users.

56. The server of claim 49, further characterized by

5 means (670) for receiving a delete content primitive from a deleting user having information elements identifying said delete content primitive, a delete transaction, the deleting user, a deleting client used by said deleting user, said group, and content for deletion, and by
means (27b) for deleting said shared content.

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57. The server of claim 42, further characterized by

means (660) for providing a content information primitive to a notified user from a server having information elements identifying said content information primitive, a store transaction, and a header, by

15 means (654) for receiving a get content information primitive from said notified user having information elements identifying said get content primitive, a retrieval transaction, and said notified user, and by

means (668) for providing a receive content primitive from said server to said notified client having information elements identifying said receive
20 content primitive, said retrieval transaction, said header, and having an information element containing shared content.

58. The server of claim 57, further characterized by means (650) for receiving a store content primitive at said server having content in an

25 information element thereof for said adding to said shared content along with or according to information elements identifying said store content primitive, a store transaction, the storing user and a header.

59. The server of claim 57, further characterized by means (670) for

30 receiving a delete content primitive from said deleting user at said server, said

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primitive having information elements identifying said delete content primitive, a delete transaction, the deleting user and content for deletion.

60. The server of claim 42, further characterized by

5 means (710; 730) for use in exception handling of a transaction by a user or server in responding to a request by said server or said user, respectively, by

means (714; 734) for providing a status primitive in said responding to said request for indicating success or failure of said transaction as well as
10 further information contained in information elements of said status primitive, and by

means (720; 740) for receiving said status primitive in said requesting server or said requesting user for recognizing said indication of success or failure.

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61. The server of claim 60, wherein said information elements include a message identifier, a transaction identifier, and a status value indicative of said success or failure.

20 62. A system for the management of presence information for use in a communication system comprising:

IM client; and

an IM server in the network, wherein the IM servers may be connected each other to exchange instant messages.